

## **REMARKS**

Claims 1-11 are in this application. Claims 2 and 3 have been amended.

The amendments to the claims are to expedite prosecution by eliminating prolonged arguments over matters that are not of concern to the Applicant regarding the patent application and that are not directed to the patentability of the claims. They should therefore have no effect on the application of the doctrine of equivalents to the newly amended claims.

The Examiner has rejected Claims 2 and 3 under 35 USC 112, second paragraph as allegedly being indefinite for failing to particularly point out and distinctly claim subject matter which the applicant regards as the invention. Applicants respectfully traverse this rejection.

The Examiner objected to Claim 2 on the basis thereof that there is some overlap, as regards carbon numbers and hence boiling ranges, of heavy paraffinic hydrocarbons, medium paraffinic hydrocarbons and light paraffinic hydrocarbons. It is well known to persons skilled in the art that, when dealing with petroleum fractions, there is usually in practice an overlap of the fractions. In other words, there is usually not a clear cut distinction, in a petroleum stream comprising a range of hydrocarbons having differing boiling points, between different fractions such as a heavy paraffinic hydrocarbon fraction, a medium paraffinic hydrocarbon fraction and a light paraffinic hydrocarbon fraction. This is borne out by, for example, US 4,041,097, which the Examiner has relied on and which is discussed in more detail hereunder, and which specifies that a first side stream withdrawn from a distillation column is a Fischer-Tropsch synthetic naphtha having an end point in the range of about 320°F up to 400°F. It then goes on to specify that a second lower side stream that is recovered boils in the range of about 320°F (i.e. below the upper limit of about 400°F specified for the first or upper side stream) to about 600°F. However, in order to overcome this objection as expeditiously as possible and, as indicated above, to avoid prolonged arguments over matters that are not of concern to the applicant and are not directed to the patentability of the claims, Claim 2 has nevertheless been amended to delete therefrom the ranges of carbon numbers of the different paraffinic hydrocarbon fractions.

Claim 3 has similarly been amended to delete therefrom the carbon number ranges for the hard wax, the medium wax and the paraffins, for the same reasons.

Therefore it is respectfully requested that this rejection be withdrawn.

The Examiner has rejected claims 1-3 as being anticipated by Ireland (US Patent 4,041,097) Applicants respectfully traverse this rejection.

The Examiner contends that Ireland et al (US 4,041,097) teaches the process of Claim 1, viz a process for separating a Fischer-Tropsch derived paraffinic hydrocarbon feedstock into an overhead stream, a side stream and a bottom stream, with the side stream and the bottom stream comprising useable wax products. The Examiner further contends that any wax is usable so that the feature in Claim 1 that the wax is usable, is inherent in Ireland et al.

Firstly, it is respectfully submitted that the Examiner is not correct when he contends that any wax is useable. It is well known to persons skilled in the art that all waxes are **not** useable. For example, many waxes are thermally degraded, so that they are not directly useable - see, for example, page 2 lines 25-33. As discussed on page 2 lines 7-11, by "useable wax products" is meant that the wax products are non-thermally degraded and that they meet stringent specifications in respect of properties such as congealing point, softness at various temperatures, oil content, etc. as set out on page 1, line 17 to page 2, line 6.

Ireland et al teaches the use of a distillation column 12 to obtain an overheads gaseous stream comprising C<sub>4</sub> and lower boiling components, a synthetic naphtha fraction comprising from about C<sub>5</sub> hydrocarbons to hydrocarbons boiling up to about 320°F (about 160°C), a light fuel oil fraction boiling from about 320°F (about 160°C) up to about 600°F (about 316°C), a heavy fuel oil product boiling from about 600°F (about 316°C) to 850°F (about 454°C), and a bottoms product containing material having higher boiling points than 850°F (about 454°C). In this regard reference is made to, for example, column 7 lines 39-61 of Ireland et al.

There is **no** teaching in Ireland et al that the bottoms product, which is withdrawn along the flow line 22, comprises useable wax products. Ireland et al specifies, in column 10 lines 59-63 that some of this bottoms material can be employed to maximize fuel oil products, by routing it to the hydrogenation stage 62 where it is subjected to catalytic hydrodewaxing. Clearly, this shows that the bottoms material does not comprise useable wax products.

The naphtha stream, which is withdrawn from the distillation

zone 12 along the line 16 and the light fuel oil/jet fuel stream, which is withdrawn along the line 18, clearly do not contain useable wax products. The naphtha stream is treated further to produce gasoline, while the light fuel oil/jet fuel fraction is used to produce distillate fuel oil by hydrogenation thereof in the zone 62.

Thus, the only side stream from the distillation zone 12 in Ireland et al that could possibly contain wax products is the heavy fuel oil, which is withdrawn from the distillation zone 12 along the flow line 20. As indicated hereinbefore, this fraction boils in the range 600°F (about 316°C) to 850°F (about 454°C). Hydrocarbon compounds with a carbon number of 18 have a boiling point of about 316°C, and are liquids at room temperature (25°C). Thus, the heavy fuel oil fraction contains hydrocarbons with carbon numbers of 18, it is also liquid at room temperature. This is confirmed in column 9 line 54 which specifies that this fraction is a heavy low fluidity fraction. A wax, in contrast, and as is well known to persons skilled in the art, is non-liquid or non-fluid, ie is solid, firm or plastic, at room temperature. Thus, the lowest carbon number hydrocarbon deemed to be a wax is typically C<sub>20</sub>, which is firm or plastic, and definitely non-fluid, at room temperature. As indicated on page 3 line 28, the lowest carbon number of medium wax is C<sub>20</sub>.

Although Ireland et al specifies that the fraction that is withdrawn along the line 20 is a "waxy feed" (column 9 line 56), it is respectfully submitted that a skilled person would not consider this fraction to be, or to comprise, a usable wax product. Ireland et al in fact confirms as much since it specifies that this fraction must be subjected to catalytic hydrodewaxing in the zone 68 where the heavy waxy feed is subjected to catalytic cracking to obtain dewaxed oil and gasoline. It is thus clear that the side stream that is withdrawn along the line 20 in Ireland et al does **not** comprise usable wax products as claimed in the process of Claim 1 of the present application. Still further, since Ireland et al specifies that a hydrocarbon having a boiling point of about 600°F is a **heavy** fuel oil product (column 7 lines 58/59) with the usable products obtained from this fraction being fuel oil and gasoline (column 9 lines 65/66) a person skilled in the art would clearly not consider any usable products present in the fraction withdrawn along the line 22 in Ireland et al as being usable wax products.

The process of Ireland et al is thus clearly different from that defined in Claim 1. The paraffinic hydrocarbons of the present invention are distilled into at least three fractions or streams, namely an overhead stream, a bottom stream comprising usable wax products, and at least one side stream comprising usable wax products. Ireland et al does not at all teach or suggest obtaining, through the distillation

of Ireland et al, at least one side stream comprising usable wax products and a bottom stream also comprising usable wax products. In other words, Ireland et al does not at all teach or suggest multiple fractionation of Fischer-Tropsch waxes.

Thus, one of ordinary skill in the art at the time that the invention was made, would not have looked to Ireland et al for a teaching thereof since Ireland et al does not at all deal with fractionating hydrocarbon mixtures to obtain two streams or fractions containing usable wax products.

Therefore, it is respectfully requested that the rejection of claims 1-3 over Ireland be withdrawn.

The Examiner has rejected claims 3-5 and 7-11 under 35 USC 103 as being unpatentable over Ireland. Applicants respectfully traverse this rejection.

It is respectfully submitted that since Claims 3-11 depend from Claim 1 which, as hereinbefore discussed, is clearly novel and non-obvious over Ireland et al, these claims too are non-obvious, ie patentable, over Ireland et al.

Additionally, the Examiner's contention that it would have been obvious to one having ordinary skill in the art to have modified the Ireland process by utilizing the claimed operating conditions because of the similarities between the claimed process and the Ireland process in terms of feedstocks and products, is not well founded. As hereinbefore described with respect to Claim 1, there is a marked difference between the products obtained in Ireland et al, and those obtained in the process claimed in Claim 1.

Therefore it is respectfully requested that the rejection be withdrawn.

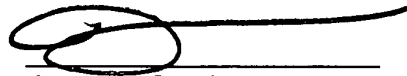
The Examiner rejected claim 6 as being obvious over Ireland et al, in view of Farnham. Applicants respectfully traverse this rejection.

The Examiner is referred to the comments above. Since claim 1 is patentable over Ireland, claim 6 must also be patentable. The Examiner's attention is drawn to what is set out in this respect in the response filed 27 August 2001. In addition at column 4, lines 17-19 of Farnham it is stated that less than one-fifth (ie.. 20%) the amount of cooled bottoms previously used need to be recycled to adequately cool the body of the liquid. This does not suggest recycling up to 10% by volume of the bottom stream to the sump as a sump quench.

Therefore, it is respectfully requested that the rejection be withdrawn.

Applicants submit that the present application is in condition for allowance and favorable consideration is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to be "Janet I. Cord", written over a horizontal line.

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**In the Claims**

2. (twice amended) A process according to Claim 1, wherein the Fischer-Tropsch derived paraffinic hydrocarbon feedstock comprises, in addition to the heavy paraffinic hydrocarbons [which comprise hydrocarbon molecules with carbon numbers or carbon atoms in the range  $C_{15}$  and greater], the medium paraffinic hydrocarbons [comprising hydrocarbon molecules with carbon numbers in the range  $C_{10}$  to  $C_{80}$ ,] and the light paraffinic hydrocarbons [comprising hydrocarbon molecules with carbon numbers in the range  $C_{35}$  and less].

3. (amended) A process according to Claim 2, wherein the operation of the distillation column is such that it produces, as the usable wax products, hard wax [comprising hydrocarbon molecules with carbon numbers in the range  $C_{30}$  and greater,] and medium wax [comprising hydrocarbon molecules with carbon numbers in the range  $C_{20}$  to  $C_{38}$ ,] with the distillation column also producing paraffins [comprising hydrocarbon molecules with carbon numbers in the range  $C_{23}$  and less].

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